THE HUMAN LOUSE IN TRANSMISSION OF *T. DUTTONI* IN NATURE

BY

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Hitherto there has been no evidence that the human louse can act as a vector of *Treponema duttoni* in nature. Even in the laboratory Nicolle and Anderson (1927) were unable to infect lice with a Congo strain of the parasite. Recently, however, Heisch and Garnham (1948) have shown that under laboratory conditions several strains of East African *T. duttoni* can infect and undergo metacyclic development in lice, and that the infection can be transmitted by inoculation.

The present paper reports the discovery of natural infections in lice of spirochaetes indistinguishable from *T. duttoni*. The only other worker to have experimented along these lines is Blanchard (1914), who in the Congo inoculated mice with lice collected from patients infected by *T. duttoni*, but with negative results.

Lice were collected from the clothes of patients infected with *T. duttoni* at Kisumu and other places in Kenya Colony where the disease is endemic; after being kept for varying periods they were emulsified with saline and inoculated into rats and mice. Lice were collected from seven patients, and four of the batches proved infective.

Case 1.—Ten lice (L19) were collected on Aug. 26, 1946, from the clothing of a Kikuyu woman with *T. duttoni* in her blood. The following day one louse was smeared on a slide and stained; no spirochaetes were seen. On the 28th seven lice remained; these were emulsified and inoculated into Mouse 673, but infection did not result.

Case 2.—At Meru six lice (L26) from the clothing of a child aged 1 year with relapsing fever were emulsified and inoculated into Mouse 1460, but no infection resulted.

Case 3.—Sixteen lice (L26) from the trousers of a sophisticated Tanganyikan African suffering from relapsing fever, and with quite numerous spirochaetes in his blood, were emulsified and inoculated into Mouse 1593; there was no infection.

Case 4.—Eight lice (L30a) were collected at Kisumu from the clothes of a patient with spirochaetes in his blood. Six hours later they were emulsified and inoculated into Rats 2574 and 2548, both of which became infected.

Case 5.—Two lice (LKU8) were removed from the head of a child of the Jaluo tribe at Kisumu with spirochaetes in his blood. After five hours they were emulsified and inoculated into Rat KU19, which subsequently became infected.

Case 6.—Forty-eight lice (LKU9) were collected from an adult male of the Jaluo tribe at Kisumu with relapsing fever spirochaetes in his blood. Twenty-five of these were inoculated into a rat after forty-eight hours and the remaining 23 were inoculated into Rat KU24 after seventy-two hours. Both these animals became infected.

Case 7.—Sixteen lice (LKU10) from the clothes of a Jaluo male aged 18 with spirochaetes in his blood were emulsified and inoculated after twenty-seven hours into Rat KU25, which subsequently became infected.

Discussion

The recovery of spirochaetes from four out of seven batches of lice collected from patients infected with *T. duttoni* is further evidence that the louse is able to act as a vector of this organism in nature. It might be objected that the infections caused in mice and rats were examples of mechanical transmission, but this seems unlikely, as the lice were kept for periods up to three days before inoculation. The criticism might also be made that the strains recovered were in reality not *T. duttoni* but some other

species of spirochaete. However, the strains proved to be *T. duttoni*, because they were capable of infecting *Ornithodoros moubata*, they caused typical infections in laboratory animals, and they were markedly neurotropic (residual brain infections in rats and mice).

It is strange that epidemics of louse-borne *T. duttoni* have rarely if ever been known to occur. This may be due to the existence of an immunity in the populations of endemic areas or because the louse is a less efficient vector of *T. duttoni* than of *T. recurrentis*.

Summary

Of seven batches of lice collected in Kenya Colony from patients infected with *T. duttoni* four were found to be infective when inoculated into rats and mice.

The spirochaetal strains recovered proved to be *T. duttoni* and not any other species of spirochaete.

Although it is probable that the louse can act as a vector of *T. duttoni* in nature, it is not known how often or with what degree of facility this occurs.

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MENINGOCOCCAL CONJUNCTIVITIS

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An intracellular Gram-negative diplococcus in the exudate of a purulent conjunctivitis is often assumed to be a gonococcus, but full bacteriological investigation sometimes shows it to be a meningococcus. There are numerous references in the literature to the presence of meningococci in the conjunctiva, but the methods of identification employed in the earlier cases, at least, are not now acceptable.

Case Report

A boy aged 3½ years attended the casualty department with a gross purulent conjunctivitis of the left eye of one day's duration. The cornea was clear and the interior of the eye normal. The condition was completely cured within eight days by local treatment with 30% sulphacetamide ("albicid") hourly, penicillin in saline (2,000 units per ml.) every half-hour, atropine, and the provision of coloured glasses. The right eye was healthy.

Bacteriology.—When first seen films from the left eye showed pus cells with numerous intracellular and extracellular Gram-negative diplococci, and cultures yielded a copious growth of these and a scanty one of *Staphylococcus aureus*. The Gram-negative cocci were strict aerobes, grew only on media containing blood or serum, and fermented glucose and maltose but not lactose or saccharose. Their colonies were denser and more luxuriant than those of gonococci, and suspensions of them were agglutinated to titre by the Standard Laboratory's (Griffith) Group II meningococcal antiserum and to 1 in 25 by Griffith's Group I antiserum. The organism was therefore identified as *Neisseria meningitidis* (Griffith's Group II). The right eye did not yield the neisseria. The nasopharynxes of the patient, his parents, and five sisters were all examined for neisseriae without success.